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10/700,310	10/31/2003	Ian Robinson	NG(ST)-6564	5457

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EXAMINER	
LEE, SIU M	
ART UNIT	**PAPER NUMBER**
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SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/700,310	ROBINSON, IAN	
	Examiner	Art Unit	
	Siu M. Lee	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 31 October 2003.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-48 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-17,26-30,34,35,38-42 and 44-46 is/are rejected.

7)☒ Claim(s) 18-25,31-33,36,37,43,47 and 48 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 31 October 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 4/18/2005.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 28, 29 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Rybicki et al. (US 7,184,490 B1).

(1) Regarding claim 1:

Rybicki et al. discloses a transmitter comprising a digital exciter (signal generator 12 in figure 17) that provides a digital multi-carrier signal from baseband data (figure 9 is a schematic block diagram of the signal generator 12, column 4, lines 51-64); a digital-to-analog converter that converts the digital multi-carrier signal into an analog multi-carrier signal (DAC 132 in figure 17, column 7, lines 1-2); a signal distributor that distributes the analog multi-carrier signal into a plurality of analog carrier signals (the RF up-conversion section 134, the gating signal module 142 and the amplifiers 136, 138 and 140, column 7, lines 6-11); and a plurality of antennas, each of the plurality of antennas transmitting at least one of the plurality of analog carrier signals (transmitting

module 24 in figure 17, figure 8 shows the details of the transmitting module 24 which includes a plurality of antenna 44-48, column 4, lines 44-50).

(2) Regarding claim 28:

Rybicki et al. discloses a system comprising means for combining a plurality of carrier signals into a combined multi-carrier signal represented in a first domain (signal generator 12 in figure 17, figure 9 is a schematic block diagram of the signal generator 12, column 4, lines 51-64); means for converting the combined multi-carrier signal from the first domain to a second domain (the DAC 132 in figure 17 convert the signal 28 from digital domain into analog signal 144 in the analog domain, column7, lines 1-2); and means for distributing the converted multi-carrier signal (the RF up-conversion section 134, the gating signal module 142 and the amplifiers 136, 138 and 140, column 7, lines 6-11) into a plurality of signals represented in the second domain (the analog signal 144 is being distributed to a transmitting module 24, the transmitting module 24 is a multiple antenna array as shown in figure 8, (column 7, lines 2-11).

(3) Regarding claim 29:

Rybicki et al. further discloses that the means for converting the multi-carrier signal from a first domain to a second domain comprising means for converting a digital multi-carrier signal into an analog multi-carrier signal (the DAC 132 in figure 17 convert the signal 28 from digital domain into analog signal 144 in the analog domain, column7, lines 1-2).

(4) Regarding claim 34:

Rybicki et al. discloses a method of transmitting a multi-carrier signal, comprising generating a digital multi-carrier signal at an exciter (signal generator 12 in figure 17, figure 9 is a schematic block diagram of the signal generator 12, column 4, lines 51-64); converting the digital multi-carrier signal into an analog multi-carrier signal (DAC 132 in figure 17, column 7, lines 1-2); distributing the analog multi-carrier signal into a plurality of analog signals (the RF up-conversion section 134, the gating signal module 142 and the amplifiers 136, 138 and 140 in figure 17, column 7, lines 6-11); and providing the plurality of analog signals to respective antennas for transmission (transmitting module 24 in figure 17, figure 8 shows the details of the transmitting module 24 which includes a plurality of antenna 44-48, column 4, lines 44-50).

3. Claims 12, 13, 15, 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Pratt (US 6,664,921 B2).

(1) Regarding claim 12:

Pratt discloses a receiver assembly comprising at least one antenna (antenna ANT 1 to ANT K in figure 4), a plurality of analog carrier signals being received at the at least one antenna (radio frequency signal is received by each antenna element 10A, column 9, lines 28-30); a signal combiner (front end antenna circuits 150, adder 155, bandpass filter 161 and the amplifier 163) that combines the analog carrier signals at least one antenna into an analog multi-carrier signal (column 9, lines 57-62); an analog-to-digital converter (ADC 165 in figure 4) that converts the analog multi-carrier signal into a digital multi-carrier signal (column 9, lines 62-63); and a digital processing

assembly that processes the digital multi-carrier signal to extract information from the multi-carrier signal (column 10, lines 2-15).

(2) Regarding claim 13:

Pratt discloses the signal combiner comprising at least one mixer (mixers 150C) for downconverting analog carrier signals, a given mixer being associated with a respective one of the at least one antennas and having an associated intermediate frequency (the mixers 150C serve as down converters, converting the received signals to an intermediate frequency, column 9, lines 57-59).

(3) Regarding claim 15:

Pratt discloses the signal combiner comprising a code division multiple access multiplexer (the separate antenna circuits are code-division-multiplexed prior to most of the radio frequency and intermediate frequency processing, the signal from each channel is multiplied by a pn code from code generator 153, column 9, lines 25-38, 43-51).

(4) Regarding claim 16:

Pratt discloses the signal combiner comprising a plurality of coders that provide respective spreading codes to the analog carrier signals, the respective spreading codes being mutually orthogonal (the pseudo random bit sequence code generator 153 generates a different code signal for each antenna signal, column 9, lines 43-51).

4. Claims 28, 30, 38 and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Clifford (US 7,013,166 B2).

(1) Regarding claim 28:

Clifford discloses a system comprising means for combining a plurality of carrier signals into a combined multi-carrier signal represented in a first domain (combiner unit 361 in figure 4 combines the channel signals received from each channel of each sector antenna in analog domain, column 3, lines 63-65); means for converting the combined multi-carrier signal from the first domain to a second domain (analog-to-digital converter circuit 365 converted the analog baseband multicarrier signal into digital domain, column 4, lines 10-13); and means for distributing the converted multi-carrier signal into a plurality of signals represented in the second domain (baseband channelizer unit 366 adapted to re-allocate individual data of the data stream to the respective original channel, column 4, lines 13-18).

(2) Regarding claim 30:

Clifford discloses the means for converting the multi-carrier signal from a first domain to a second domain comprising means for converting an analog multi-carrier signal into a digital multi-carrier signal (analog-to-digital converter circuit 365 converted the baseband multicarrier signal into digital domain, column 4, lines 10-13).

(3) Regarding claim 38:

Clifford discloses a method of processing a plurality of carrier signals comprising receiving a plurality of analog carrier signals at a plurality of antennas (multi-carrier 36 receives channel signals from each channel of each sector antenna, column 3, lines 63-66); combining the plurality of analog carrier signals into a multi-carrier analog signal (combiner 361 combines the channels signals received from each channel of each

sector antenna, column 3, lines 63-66); converting the analog multi-carrier signal into a digital multi-carrier signal (analog-to-digital converter circuit 365 converts the baseband analog multi-carrier signal into digital data stream, column 4, lines 10-13); and processing the digital multi-carrier signal at a digital processing assembly (the baseband channelizer 366 adapted to re-allocated individual data of the data stream to the respective original channel, which are further processed in the base transceiver station 30, column 4, lines 13-18).

(4) Regarding claim 39:

Clifford discloses the combining of the plurality of analog carrier signals comprising converting each received carrier signal to a unique frequency (combiner 361 combine the channel signals received from each channel of each sector antenna by allocating an individual narrowband carrier to each channel signal and modulating the allocated carrier based on the channel signal, column 3, line 64-column 4, line1).

5. Claim 44 is rejected under 35 U.S.C. 102(e) as being anticipated by Pugel et al. (US 2004/0041945 A1).

Pugel et al. discloses a receiver assembly (signal receiver in figure 1) comprising at least one antenna that receives an analog signal comprising at least one frequency band of interest and at least one frequency band containing an interfering signal (the analog television signals are received at an antenna (not shown) and are then applied to RF input point 22, paragraph 0015, lines 4-5); an analog-to-digital converter that creates a digital representation of the analog signal (A/D converter 172 in figure 1

generate a digitized IF signal, paragraph 0022, lines 1-2) ; a digital processing component (microprocessor 50 in figure 1) that receives the digital representation of the analog signal (the demodulator 174 demodulates the digitized IF signal from A/D converter 172 and generate parameter information to the microprocessor 50, paragraph 0022, lines 1-8) and produces a control signal specifying the at least one frequency band containing the interfering signal (microprocessor 50, via digital-to-analog converter (DAC) IC 40 and control the tunable single-tuned (ST) filter 114 by the tuning signal ST, paragraph 0017, lines 8-10); and at least one adjustable filter (tunable single-tuned (ST) filter 114), electrically adjustable to change at least one frequency characteristic associated with the filter in response to the control signal, that attenuates the specified at least one frequency band within the analog signal (tunable filter 114 attenuates the undesirable signals which might cause cross-modulation interference, paragraph 0017, lines 1-3).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 2, 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rybicki et al. (US 7,184,490 B1) in view of Toivola (US 6,081,515).

(1) Regarding claim 2:

Rybicki et al. discloses all the subject matter as discuss in claim in except the signal distributor comprising at least one filter, the at least one filter being electrically adjustable by the exciter as to change at least one frequency characteristic associated with the at least one filter.

However, Toivola discloses the signal distributor (antenna arrangement in figure 4a) comprising at least one filter (electrical controllable filter 41_1 to 41_n, column 8, lines 15-31), the at least one filter being electrically adjustable (a number of controllable filter arrangements provided in the antenna arrangement are tuned (step 180 in figure 9) which suitable is done by the base station, how and where they are tuned can naturally be done I a suitable way, column 10, lines 21-24, as shown in figure 3 that the base station 10 comprises the combiner (frequency combiner 1), it would be obvious that the controllable filter is being electrically control by the exciter) by the exciter as to change at least one frequency characteristic associated with the at least one filter.

It is desirable for the signal distributor comprising at least one filter, the at least one filter being electrically adjustable by the exciter as to change at least one frequency characteristic associated with the at least one filter because only some of the single-frequency signals are needed to be amplified, simple amplification devices can be used (column 5, lines 17-19). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Toivola in the system of Rybicki et al. to simplify the system.

(2) Regarding claim 4:

Toivola further discloses that the at least one frequency characteristic comprising a center frequency of a passband associated with the at least one filter (it become possible to use controllable bandpass filter, column 10, lines 35-36).

(3) Regarding claim 5:

Toivola further discloses that the at least one frequency characteristic comprising respective center frequencies of a plurality of passbands (an amplifier can frequently be arranged for two electrically controllable filters, an amplification device for three electrically controllable filters or every conceivable combination, column 8, lines 20-31), the center frequency of each passband being electrically adjustable by the exciter (a number of controllable filter arrangements provided in the antenna arrangement are tuned (step 180 in figure 9) which suitable is done by the base station, how and where they are tuned can naturally be done I a suitable way, column 10, lines 21-24, as shown in figure 3 that the base station 10 comprises the combiner (frequency combiner 1), it would be obvious that the controllable filter is being electrically control by the exciter).

(4) Regarding claim 6:

Rybicki et al discloses all the subject matter as discuss in claim 1 except the at least one frequency characteristic being a center frequency of a stopband associated with the at least one filter.

However, Toivola discloses the at least one frequency characteristic being a center frequency of a stopband associated with the at least one filter (the electrically controllable filter 41 to 4n are s tuned that from everyone a signal having desirable frequency is received , in such electrically controllable filter all remaining frequencies

are filter away except the just the one which is preferred for each filter, column 6, lines 57-61).

It is desirable for the at least one frequency characteristic being a center frequency of a stopband associated with the at least one filter because it is easy to repair or change (column 5, lines 26-27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Toivola in the system of Rybicki et al. to increase the flexibility of the system.

(5) regarding claim 7:

Toivola further discloses that the at least one frequency characteristic comprising respective center frequencies of a plurality of stopbands (an amplifier can frequently be arranged for two electrically controllable filters, an amplification device for three electrically controllable filters or every conceivable combination, column 8, lines 20-31), the center frequency of each stopband being electrically adjustable by the exciter (a number of controllable filter arrangements provided in the antenna arrangement are tuned (step 180 in figure 9) which suitable is done by the base station, how and where they are tuned can naturally be done I a suitable way, column 10, lines 21-24, as shown in figure 3 that the base station 10 comprises the combiner (frequency combiner 1), it would be obvious that the controllable filter is being electrically control by the exciter).

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rybicki et al. (US 7,184,490 B1) in view of Jago et al. (US 2003/0171674 A1).

Rybicki et al. discloses all the subject matter as discuss in claim 1 except the signal distributor comprising a time division demultiplexer.

However, Jago et al. discloses the signal distributor (signal separator 56) comprising a time division demultiplexer (the signal separator 56 in figure 3 is implemented using a time-division demultiplexer 64, paragraph 0022, lines 4-5).

It is desirable for the signal distributor comprising a time division demultiplexer because it simplified the system and reduce the hardware required (paragraph 0009, lines 1-6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Jago et al. in the system of Rybicki et al. to simplify the system.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rybicki et al. (US 7,184,490 B1) in view of Pratt (US 6,664,921 B2).

Rybicki et al. discloses all the subject matter as discuss in claim 1 except the signal distributor comprising a plurality of decoders, providing respective despreading codes to a multi-carrier signal.

However, Pratt discloses the signal distributor (plurality of channel 167) comprising a plurality of decoders, providing respective despreading codes to a multi-carrier signal (the plurality of channels 167 each containing a mixer 167A which receives the same respective code as that applied in respect of the relevant antenna in mixer 150C, this has the effect of isolating the representation of the respective received

signal at the output of the mixer 167A, this output representation then being split into plural sub-channel 169, column 10, lines 3-10).

It is desirable for the signal distributor comprising a plurality of decoders, providing respective despreading codes to a multi-carrier signal because it improves the phase tracking accuracy (column 2, lines 60-64). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Pratt in the system of Rybicki et al. to improve the performance of the system.

10. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rybicki et al. (US 7,184,490 B1) inv view of Naidu et al. (US 5,805,983).

(1) Regarding claim 10:

Rybicki et al. discloses all the subject matter as discuss in claim 1 except the exciter and the digital-to-analog converter being located at a first location, and at least one of the pluralities of antennas being located at a second location, spatially remote from the first location.

However, Naidu et al. discloses the exciter and the digital-to-analog converter being located at a first location, and at least one of the plurality of antennas being located at a second location, spatially remote from the first location (base station 50_1 and 50_2 are connected to the remote antenna 68_1, 68_2, 70_1 and 70_2 through fiber node 58 and coaxial cable 60, column 1, line 58-column 2, line1).

It is desirable for the exciter and the digital-to-analog converter being located at a first location, and at least one of the plurality of antennas being located at a second

location, spatially remote from the first location because it enhanced the air frame timing between cells served by the remote antenna unit (column 1, lines 24-26). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Naidu et al. in the system of Rybicki et al. to improve the performance of the system.

(2) Regarding claim 11:

Rybicki et al. discloses all the subject matter as discuss in claim 1 except at least one antenna being located at a third location, spatially remote from the first location and the second location.

However, Naidu et al. disclose at least one antenna being located at a third location, spatially remote from the first location and the second location (as shown in figure 3, each of the four transmission paths may have different length which cause different delay time for the signal, column 2, lines 50-52).

It is desirable for at least one antenna being located at a third location, spatially remote from the first location and the second location because it equalizes the system without requiring the transmission link to be out of service during the upgrades or repairs (column 9, lines 26-30). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Naidu et al. in the system of Rybicki et al. to improve the reliability of the system.

11. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt (US 6,664,921 B2) in view of Ishikawa et al. (US 5,408,690).

Pratt discloses all the subject matter as discuss in claim 12 except the signal combiner comprising a frequency multiplexer.

However, Ishikawa et al. discloses a signal combiner (combiner 204 in figure 16) comprising a frequency multiplexer (column 26, lines 37-40).

It is desirable for a signal combiner comprising a frequency multiplexer because a precision of detecting the level of the reflected wave can be remarkably improved (column 14, line68-column 15, line2). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Ishikawa et al. in the system of Pratt to improve the performance of the system.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt (US 6,664,921 B2) in view of Pugel (us 2004/0041945 A1).

Pratt discloses all the subject matter as discuss in claim 12 except the at least one antenna having respective associated tracking assemblies that determine a frequency band associated with an interfering signal.

However, Pugel et al. discloses the at least one antenna having respective associated tracking assemblies that determine a frequency band associated with an interfering signal (the microprocessor 50 determine the frequency band associate with the cross-modulation interference and control the tunable filter 114 to attenuate the undesirable signal, paragraph 0017, lines 1-3, 8-10).

It is desirable to have at least one antenna having respective associated tracking assemblies that determine a frequency band associated with an interfering signal

because it provide protection from interference and reduce loss (paragraph 0017, lines 5-8). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Pugel et al. in the system of Pratt to improve the performance of the system.

13. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt (US 6,664,921 B2) in view of Naidu et al. (US 6,128,470). .

(1) Regarding claim 26:

Pratt discloses all the subject matter as discuss in claim 12 except the analog-to-digital converter and the digital processing assembly being located at a first location, and a first of the at least one antenna being located at a second location, spatially remote from the first location.

However, Naidu et al. discloses the analog-to-digital converter and the digital processing assembly being located at a first location, and a first of the at least one antenna being located at a second location, spatially remote from the first location (the system comprises a plurality of remote antenna unit 68_1, 68_2, 70_1, 70_2 connect to the base station equipment 50_1 and 50_2 in figure 2, column 1, lines 43-54).

It is desirable for the analog-to-digital converter and the digital processing assembly being located at a first location, and a first of the at least one antenna being located at a second location, spatially remote from the first location because it reduces the cumulative noise in a distributed antenna network (column 2, lines 48-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time of

invention to employ the teaching of Naidu et al. in the system of Pratt to improve the quality of the system.

(2) Regarding claim 27:

Naidu et al further discloses that a second of the at least one antenna being located at a third location, spatially remote from the first location and the second location (the system comprises a plurality of remote antenna unit 68_1, 68_2, 70_1, 70_2 connect to the base station equipment 50_1 and 50_2 in figure 2, column 1, lines 43-54).

14. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rybicki et al. (US 7,184,490 B1) in view of Toivola (US 6,081,515).

Rybicki et al discloses all the subject matter as discuss in claim 34 except distributing of the analog multi-carrier signal comprising filtering a plurality of copies of the multi-carrier analog signal at respective tunable filters.

However, Toivola discloses distributing of the analog multi-carrier signal comprising filtering a plurality of copies of the multi-carrier analog signal at respective tunable filters (the antenna arrangement in figure 4 shows filtering of plurality of the multi-carrier analog signal at respective tunable filters 41_1 to 41_n before passing the signal to the radiant element 61_1 to 61_n, column 8, lines 13-31).

It is desirable to distributing of the analog multi-carrier signal comprising filtering a plurality of copies of the multi-carrier analog signal at respective tunable filters because it lowers the complexity whereby a higher integration level is made possible (column 10, lines 12-17). Therefore, it would have been obvious to one of ordinary skill

in the art at the time of invention to employ the teaching of Toivola in the system of Rybicki et al to increase the flexibility of the system.

15. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clifford (US 7,013,166 B2) in view of Pratt (US 6,664,921 B2).

Clifford discloses all the subject matter as discuss in claim 28 except the combining of the plurality of analog carrier signals comprising applying a spreading code to each of the analog carrier signals and summing.

However, Pratt discloses the combining of the plurality of analog carrier signals comprising applying a spreading code to each of the analog carrier signals and summing (the antenna circuit 150 and the adder 155 in figure 4, column 9. lines 40-51).

It is desirable to combine the plurality of analog carrier signals comprising applying a spreading code to each of the analog carrier signals and summing because it has the advantage of improving the signal-to-noise ratio of each of the signal being observed (column 5, lines 40-42). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Pratt in the system of Clifford to improve the quality of the signal.

16. Claims 41 to 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clifford (US 7,013,166 B2) in view of Pugel et al. (US 2004/0041945 A1).

(1) Regarding claim 41:

Clifford discloses all the subject matter as discuss in claim 38 except the method further comprising determining a frequency band associated with an interfering signal.

However, Pugel et al. discloses a method that determining a frequency band associated with an interfering signal (demodulator 174 demodulates he digitized signal from ADC 172 and provides the microprocessor 50 with the signal-to-noise information, microprocessor 50, via PLLIC 30 and DAC IC 40 controls the tunable circuit 114 to attenuates the undesirable signal which might cause cross-modulation interference, paragraph 0017, lines 1-3 and paragraph 0022, lines 1-8).

It is desirable to determining a frequency band associated with an interfering signal because it provides protection from interference and reduce loss (paragraph 0017, lines 5-8). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Pugel et al. in the method of Clifford to improve the performance of the method.

(2) Regarding claim 42:

Clifford further discloses attenuating the interfering signal in response to the determination of the associated tracking assembly (microprocessor 50, via PLLIC 30 and DAC IC 40 controls the tunable circuit 114 to attenuates the undesirable signal which might cause cross-modulation interference, paragraph 0017, lines 1-3 and paragraph 0022, lines 1-8).

17. Claims 45 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pugel et al. (US 2004/0041945 A1) in view of Ibrahim et al. (US 6,914437 B2).

Regarding claim 45 and 46, Pugel et al. discloses all the subject matter as discussed in claim 44 except the attenuation component comprising a stop band filter, being electrically adjustable in response to the control signal as to change a center frequency associated with at least one stopband.

However, Ibrahim et al. discloses the attenuation component (filter circuit 100 in figure 3) comprising a stop band filter, being electrically adjustable in response to the control signal as to change a center frequency associated with at least one stopband (the filter circuit 100 in figure 3, the filter circuit 100, which may be a low pass filter, a bandpass filter, a stop band filter or a high pass filter, column 5, lines 41-43).

It is desirable for the attenuation component comprising a stop band filter, being electrically adjustable in response to the control signal as to change a center frequency associated with at least one stopband because it allows a highly precise circuit on an integrated circuit be accurately tuned to provide desirable performance (column 2, lines 21-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Ibrahim et al. in the system of Pugel et al. to improve the performance of the system.

18. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rybicki et al. (US 7,184,490 B1) in view of Toivola (US 6,081,515) as applied to claim 2 above, and further in view of Lau et al. (US 6,291,924 B1).

Rybicki et al. and Toivola disclose all the subject matter as discuss in claim 2 except the at least one filter comprising a surface acoustic wave (SAW) filter having at least one electrically actuatable micromechanical structures.

However, Lau et al. discloses a surface acoustic wave (SAW) filter having at least one electrically actuatable micromechanical structures (column 9, line 59-column 10, line24).

It is desirable to surface acoustic wave (SAW) filter having at least one electrically actuatable micromechanical structures because it avoids the need to fabricate a new SAW device (column 1, lines 62-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Lau et al. in the system of Rybicki et al. and Toivola to improve the flexibility of the system.

Allowable Subject Matter

19. Claims 18-25, 31-32, 36-37, and 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tomano (US 5,526,529) discloses a transmission level control system and method in radio communication station. Schwaller (US 5,585,850) discloses an adaptive distribution system for transmitting wideband vedio data over narrowband multichannel wireless communication system. Caimi et al. (US 2004/0227683 A1) discloses an integrated front end antenna. Lindenmeier et al. (US 6,925293 B2) discloses an antenna diversity system with phase controlled summation

of antenna signal.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Siu M. Lee whose telephone number is (571) 270-1083. The examiner can normally be reached on Mon-Fri, 7:30-4:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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3/2/2007

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